HP-UX 11i v3 (11.31) Update Training

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Agenda

1) HP-UX 11i v3 Overview
2) Supported systems and hardware
3) Installation, Update, and Configuration
4) Flexible Capacity Features
5) Secured Availability Features
6) Simplified Management Features
7) Q&A

Release Review

Official Name	Release Identifier	Architecture
HP-UX 11i Version 1 (v1)	B.11.11	PA-RISC
HP-UX 11i Version 1.5 (v1.5)	B.11.20	Intel® Itanium®
HP-UX 11i Version 1.6 (v1.6)	B.11.22	Intel® Itanium®
HP-UX 11i Version 2 (v2)	B.11.23	Intel® Itanium®
HP-UX 11i v2 update 2 (v2UD2)	B.11.23 B.11.23.0409	Intel® Itanium® & PA-RISC
HP-UX 11i v3	B.11.31	Intel® Itanium® & PA-RISC

Purpose of HP-UX 11.31

HP-UX 11i v3 is the next enterprise release delivering expanded infrastructure for the Adaptive Enterprise in a multi-OS world

- Competes with IBM's On Demand, Power architecture and AIX
- Delivers enhanced performance and feature capabilities for Montecito-based platforms
- Delivers the enablers for a more competitive virtualization solution, including both vPars and Integrity VM
- Enhanced HP-UX I/O infrastructure for improved scalability, manageability and agility
- Improves interoperability with other UNIX systems

HP-UX 11.31 fulfills strategy

- Targeted at both Itanium-based and PA systems

HP-UX 11i v3 Delivers Leadership Performance

Greater than 30% performance improvements over HP-UX 11i v2 on the same server

World's fastest and best price/performance TPC-H 10TB benchmark

- Measures business intelligence performance
- Achieved on a Superdome server with 64 Montecito processors (128 cores) running HP-UX 11i v3 and Oracle 10g R2
- Delivered 171,380 tpmC at a price/performance of $38.98/QphH

World's fastest SAP SD 2 Tier benchmark ever

- Tests performance of ERP applications
- Achieved with HP-UX 11i v3 on an HP Integrity Superdome with 64 Dual-Core Itanium 2 (Montecito) processors and 14 MSA 1000 StorageWorks arrays
- Delivered 152,530 SAPs and 30,000 SD users

Improved performance

- Unified File Cache (UFC)
- Enhanced HP Logical Volume Manager (LVM) striping and mirroring
- Networking

For up-to-the-minute updates on HP-UX 11i performance

- Visit www.hp.com/go/hpux11iperformance

HP-UX 11i v3 Delivers Scalability and Availability

Increased scalability

- Double the number of processes:30000->60000
- PID range:0~1 billion
- Increased username/hostname length:8->255
- Larger file size:<=16TB
- Larger LVM volume size:<=32TB
- More Logical Units (LUNs):<=16384

Mainframe-class UNIX system availability

- Hot swap processors and memory

Enhanced disaster tolerance and manageability

- Modular software selection
- Automated PCI I/O recovery
- Dynamic Root Disk cloning

For up-to-the-minute updates on HP-UX 11i

- Visit www.hp.com/go/hpux11i

HP-UX 11i v3 Feature Overview, 1 of 2

Integrated multipathing with the Next Generation Mass Storage Stack

- Manages I/O devices, such as SCSI logical units (LUNs)
- Enhances server scalability, adaptability, and performance while retaining backward compatibility
- New features include
  - Flexible, agile and manageable LUN addressing
  - Native multi-pathing
  - Increased parallelization
- Enables enhanced storage scalability
  - Unlimited number of I/O busses, up from 256
  - 16384 LUNs supported per system, up from 8192 active LUNs
  - LUN size over 2TB
  - 32 distinct I/O paths to a LUN, up from 8

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HP-UX 11i v3 Feature Overview, 2 of 2

New agile view of mass storage

- New naming convention for persistent disk and tape device special files
- New minor number format that supports much larger I/O configurations
- Represents hardware pathing to disk and tape devices

New security and availability offerings

- Provide increased resiliency, layered security and in-depth protection, and multi-OS management

New modular operating environments

- Provide more flexibility in managing the products to install and update on a system

HP-UX 11iv3
Supported Systems and Hardware

Montecito/Montvale Processor
Supported Systems
Supported Peripherals

Montecito/Montvale Overview

Montecito is Intel® Itanium-2 8870, Montvale:9100

Terminology tutorial:

- Processor (was socket),
- Core
- Hyperthread (or hardware thread), LCPU in HP-UX
- ~~CPU~~ (it's too ambiguous)

90 nm version of Madison

2 cores per processor

1-2 hyperthreads per core

- Up to 4 hyperthreads (or LCPUs) per processor

L3 cache: 24MB (12MB per core)

E.g. sx2000 with Montecito – 64 processors , 2 cores per processor, up to 2 hyperthreads per core means 256 max hardware threads (or LCPUs)

11.23 (without HT)—>11.31 (with HT)—>

Blades and Entry-level Servers

Blades

- All Blades (Itanium) are supported
  - BL60p blade server
- Hurricane, ATCA, Tobruk

IPF Entry-level Servers

- Onyx, Ruby, Sapphire platforms
- IPF Entry-level servers with all supported processors through Mad9 and Montecito
  - rx2600-2, rx2620 (Long's Peak) (Also rx1600, rx1620 entry-level server)
    - 1-2 CPUs, 4 PCI, 2U
  - rx4640-8 (Mt. Diablo) (Also rx3600)
    - 1-8 CPUs, 6 PCI, 4U, 64 GB memory, 3MB L3 cache/6MB L3 cache
  - rx5670 (Everest)
    - 1-4 CPUs, 10 PCI, 7U, 96 GB memory
  - Nemesis, Pearl, BadgerPeak

PA Entry-level Servers

- rp3410-2, rp3440-4 with PA-8800 (800 MHz and 1 GHz)
- StormPeak with Mako and Shortfin processors

Mid-range Servers

IPF Mid-range servers

- rx6600
- rx7620, rx7640 (Eiger) and rx8620, rx8640 (Olympia) with Madison, Hondo, and Mad9 IPF processors
- Mittelhorn/IPF and Kona/IPF

PA Mid-range servers

- rp4440 (Mt. Hamilton), rp7420 (Medel), rp8420 (Rainier)
  - with Mako and Shortfin (a.k.a. Mako+) PA processors
- rp7405, rp7410 (Matterhorn), rp8400 (Keystorne) w/ firmware 16.8 or later
- Mittelhorn/PA and Kona/PA within 6 months of initial SR

High-end and Cell-based Servers

Integrity High-end servers

HP Integrity Superdome (Orca/IPF through Mad9)

- Significant bus bandwidth improvements from PA-RISC
- Support Management Station (SMS) is Windows 200x PC

- All SandDune/IPF

PA-RISC High-end servers

- All PA Superdomes (Superdome, Caribe, Pacu, Orca/PA)
- All SandDune/PA, Shortfin, Mittelhorn processors within 6 months of initial SR

Cell-based systems and ccNUMA Support

HP's cell-based platforms are ccNUMA

- ccNUMA = cache coherent, Non-Uniform Memory Access
- Latency and bandwidth of a same-cell memory access is better than accessing memory on a different cell

For ccNUMA platforms, HP-UX 11i v3 is ccNUMA-aware

- Maintains good behavior for applications that are not ccNUMA-aware
- Gives ccNUMA-aware applications the ability to control their memory placement as well as processor placement

Core feature of HP-UX 11i v3

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Unsupported Servers and Workstations

Unsupported systems

- All 32-bit PA-RISC servers
- All Itanium-1 based systems (rx4610, rx9610, i2000)

Unsupported PA-RISC servers

- High-end (same as HP-UX 11i v2)
  - All T-Class servers
  - All V-Class servers
- Mid-range
  - N-class (rp7400)
  - All K-Class servers (same as HP-UX 11i v2)
- Low-end
  - All D-Class, E-Class, and R-Class servers (same as HP-UX 11i v2)
  - All A-class servers (A180/A180C, rp2400, rp2405, rp2430, rp2450, rp2470)
  - All L-Class servers (rp5400, rp5405, rp5430, rp5450, rp5470)

Unsupported workstations

- No PA-RISC or Integrity workstations (zx2000, zx6000) are supported

I/O cards shipping on HP-UX 11i v3

Card Type	Description
Mass Storage	2G FC Tachlite; 2-port 2Gb FC; 2 port U320 SCSI U160 RAID - SmartArray 5304 (PA only) SmartArray 6402 2-channel and 6404 4-channel RAID 1-port and 2-port 4Gb FC card PCI-X
Networking	4-port 10/100B-TX (A23); 10/100B-TX (RJ45) Next Gen 1000B-T and –SX (5701 chip) 1000BaseSX and T Dual Port (Intel chip) 10G Ethernet; 4-port 1000B-T Ethernet; 2-port serial (X25/FR/SDLC) PCI/PCI-X 1-port 1000Base-T and –SX Adapter
Cluster	Hyperfabric II; PCI-X 2-Port 4X InfiniBand HCA (HPC), RoHS PCI-X 2-Port 4X InfiniBand HCA w/ HA and Database Support, RoHS
Combo	PCI-X 1000Base-SX and –T GigE / 2G FC Combo U320 SCSI/GigE Combo Card PCI-X 2-port 1000B-T/2-port 2Gb FC Combo 1 port and 2-port 4Gb FC & 1 port and 2-port GigE HBA PCI-X
Other	8-port and 64-port Terminal MUX (MR: 3/01) 8-port and 64-port Terminal MUX

Special I/O cards and legacy cards

Card Type	Description
Special	Obsidian USB/VGA PCI card (IPF only) Procurium GigE LAN/SCSI combo card SAS card (Core for RuSa) (IPF only) 1000BaseT Dual Port (Core only) ATI Radeon 7500 PCI Graphics Card Specials (OCBU): 8 ports ACC (A13)
Cards not on CPL, but still supported on HP-UX 11i v3	Networking: Gigabit Ethernet (1000B-SX); Gigabit Ethernet (1000B-T) Mass Storage: FCMS – Tachlite; 1 port U160 SCSI; 2 port U160 SCSI Cluster: PCI-X 2-Port 4X InfiniBand HCA (HPC) and w/ HA & DB supp
No longer on CPL, and not supported on HP-UX 11i v3	Cluster: Hyperfabric (PCI 1X); HiPPi 800 (A4) Combo: 2port Ultra2-SCSI + 2port 100T Mass Storage: FCMS – Tachyon; FWD SCSI; 2-port Ultra2 SCSI; 2-port FWD SCSI; 2-port FWD SCSI; RAID 4Si Networking: 10/100B-TX (AUI, BNC, RJ45); FDDI Dual Attach; Ultra2 SCSI; 100B-FX; ATM 622 (MMF connector); ATM 155 (MMF connector); ATM 155 (UTP5 connector); Token Ring (4/16/100 Mb/s); Intel 82559 100BT; 4-port serial (X25/FR); ATM 155 MMF (V Class only) Other: PKC (Public Key Cryptography) (A3); 8-port Terminal MUX; 64-port Terminal MUX

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HP-UX 11iv3

System Installation, Update, and Configuration

Operating Environments on HP-UX 11i v3

Foundation OE

- Web, content, and front-end servers

Enterprise OE

- Database application and logic servers
- Foundation OE plus
  - EMS HA monitors, MirrorDisk/UX, OV GlancePlus, PRM, Online JFS

Mission Critical OE

- Application servers and database servers
- Enterprise OE plus
  - ServiceGuard and ServiceGuard NFS
  - Workload Manager and Workload Manager Tookit
  - ECM Toolkit

Technical Computing OE

- Server applications using graphics applications and math libraries

No Minimal Technical Computing OE

HP-UX 11i v3 Packaging – Operating Environments

Operating Environment

- Items noted under OEs are individual bundles and are de-selectable

Terminology change to Required, Recommended and Optional

- Required are always selected and installed
- Recommended and optional products are de-selectable for cold install and update

Core is split into multiple bundles

- One Required, one Optional and the rest Recommended
- Allows customers more flexibility in what they load and maintain

Additional OE Highlights to Note

CDE is now Optional

- English was required in previous HP-UX releases
- Need to specifically select CDE now

New localized bundles

- HPUXLocales
- Extn and Man bundles
- Split out of main core bundle and can be deselected

New category tags

- Previous releases just had OrderedApps
  - All application products were here on Ignite-UX menu
- 20+ new categories
  - Including SupportTools, SystemManagement, CompilersDevelopment, DisksFileSystems, Localization, Manuals

Major Installation/Update Differences

Update from HP-UX 11i v2 only

- Not from HP-UX 11i v1

Disk Space Requirements have grown

- Different enough to cause problems when updating

Installation Configuration Requirements

To cold-install or update to HP-UX 11i v3, you must have

- Supported HP-UX system
  - Itanium-based servers include HP Integrity cx2600, rx16x0, rx26x0, rx3600, rx4640, rx5670, rx6600, rx76x0, rx86x0, rx9610, Superdome, BladeSystems BL60p
  - Several Dual-Core Intel Itanium(2) HP Integrity and Superdome servers
  - PA-RISC servers include rp34x0, rp4440, rp74xx, rp84x0, HP 9000 Superdome
  - No workstation support
- Cold-install or update HP-UX 11i v3 software sources
  - HP-UX 11i v3 OE and Application (AR) media (DVDs)
  - SD Network Depot
  - Ignite-UX server
- 1 GB memory, minimum
- 1 GB swap space, minimum
- Approximately 24 GB of disk space to install server OEs

Note that documented minimums may be low compared to typical actual configurations

Disk Requirements Comparison

File System	HP-UX 11i v2 Size	HP-UX 11i v3 Size
/usr (71% used)	2.6-3.7 GB	3.8 GB
/stand (7% used)	304 MB	1.9 GB
/var (3% used)	4.5 GB (unless MTOE which is 1.5 GB)	8.5 GB (No MTOE)
/tmp (4% used)	208 MB	512 MB
/opt (58-61% used)	2.7-4.5 GB	4.7-5.8 GB
/home (5% used)	32 MB (unless MTOE which is 20 MB)	112 MB (No MTOE)
/ (29% used)	230 MB	1 GB

Cold Install or Update?

Update from HP-UX 11iv 2 (B.11.23) Servers only

- Update to same HP-UX 11i v2 OE or higher OE
- Updating from HP-UX 11i v1 is not supported
- Tool: msv2v3check

Update Advantage

- Retain user data, configuration, and applications

Cold-install supported from any supported configuration

- See the Installation Configuration Requirements above

Cold Install Advantages

- Use of Ignite-UX server makes clean standard configurations easy
  - Use of Ignite-UX overwrites everything on the target volume
- Partitions will be sized for 11.31
  - Updating usually means that you will have to increase some file system partition sizes

HP-UX 11i v3 Hardware Paths

Agile View

- Reliability, Adaptability, Performance, Scalability
- Dynamically change paths to device
- Multiple paths to a device treated like single virtualized path
  - I/O distributed across the multiple paths

Types of paths to a device

- Legacy Hardware Path
  - Used in releases prior to 11.31
  - Bus-nexus addresses separated by / leading to HBA, additional address elements separated by .
- Lunpath Hardware Path
  - Use more targets and LUNs
  - Additional address elements printed in hex
- LUN Hardware Path
  - Virtualized path representing all the lunpaths to a single LUN
  - Virtual bus-nexus (virtual root node address of 64000)
    - 64000/0xfa00/0x22

Differences in the Cold-Install to HP-UX 11i v3

Root, dump, and swap devices configured with new agile addressing

PA-RISC BCH search command displays only legacy hardware paths

Root Disk screen displays lunpath hardware path instead of the legacy hardware path

On **Languages** screen, mark **Yes** for HPUXLocales

CDE is an optional product in HP-UX 11i v3

- If you require it, you must explicitly select the CDE bundle

Select and deselect software bundles on the **Additional Software** screen

- HP-UX 11i v3 offers several product categories
  - Each product category contains software components that are marked as *required*, *recommended*, or *optional*

Device Special Files: Installing and Updating

DSFs: Installing and Updating

- Cold-install
  - Automatically creates legacy and persistent DSFs
  - Uses persistent DSFs for boot, root, swap, and dump devices
    - /etc/fstab, /etc/lvmtab, et. al. refer to persistent DSFs
- Update
  - Retains existing legacy DSFs
    - Backward compatible, not affected by persistent DSFs
  - Creates persistent DSFs
  - Allows simultaneous access to device using legacy and persistent DSFs

See “The Next Generation Mass Storage Stack: HP-UX 11i v3” at http://docs.hp.com

Tasks Prior to Cold Installing HP-UX 11i v3

Select an HP-UX Console if needed

- Itanium-based systems only

Back up any configuration files you want to reinstall

- Configuration files in /etc
- The contents of /usr/local
- Any local home directories (that is, those you do not import from
- another system)
- Any configuration files located in the /etc/opt directories for installed software

Back up your system

- Use any supported HP-UX backup software
- Also, create an OS recovery image

Update your Ignite-UX server

- If you intend to use Ignite-UX to cold-install HP-UX 11i v3 on more than one system

Locate source media and code words

Refer to HP-UX 11i v3 Installation and Update Guide

- Information on console selection is especially useful

More Tasks Prior to Cold-Installing HP-UX 11i v3

Ensure system meets system requirements to install and operate HP-UX 11i v3

- File system sizes and disk size are especially important!

Complete preparation tasks covered on the previous slide

- Create an operating system recovery image to protect your data in the event of a system crash

Collect available networking information and other system specific data

- Refer to Installation and Update Guide for useful tables

Installation Steps - Overview

Boot system, interrupt autoboot

Load and run install kernel

- See IUG for detailed instructions for both PA and IPF systems

Select User Interface and Media Options

- UI options – Guided, Advanced, and Default without UI
- Media options – Media only, Media with network, Ignite-UX server

Configure networking if needed

- After filesets are copied to disk and system reboots, set_parms may run

If Guided or Advanced install, follow prompts

- Advanced allows you to specify OE, root disk, file system type, swap size, software, timezone, network parameters, root password, file system sizes, etc.

Perform post-load configuration

- Set network, language, etc.
- Can be bypassed if selected prior to fileset loading

Differences in the Cold-Install to HP-UX 11i v3, 1 of 3

Root, dump, and swap devices

- Configured with new agile addressing representation
- Use persistent DSFs
  - Although both legacy and persistent DSFs are created

PA-RISC boot console search command displays only legacy hardware paths

- You can specify either hardware path in Boot command

Root Disk screen displays lunpath hardware path instead of the legacy hardware path

- Select **More Info** to view legacy hardware path for selected root disk
- The lunpath hardware path selected is used only to identify the Root Disk itself
- Any available path to that disk may then be used as boot path
  - Normal to see a different lunpath hardware path to the disk used as boot path

Differences in the Cold-Install to HP-UX 11i v3, 2 of 3

If you select VxVM or LVM on the **File System Type** screen

- Then root disk cannot be moved to another SCSI bus or address that results in a change in the hardware path to the device
  - If it is moved, you may not be able to boot safely from it

On **Languages** screen, mark **Yes** for HPUXLocales and verify language choice

- Locale settings moved from CDE language bundle on HP-UX 11i v2 to HPUXLocales bundle on HP-UX 11i v3

CDE is an optional product in HP-UX 11i v3

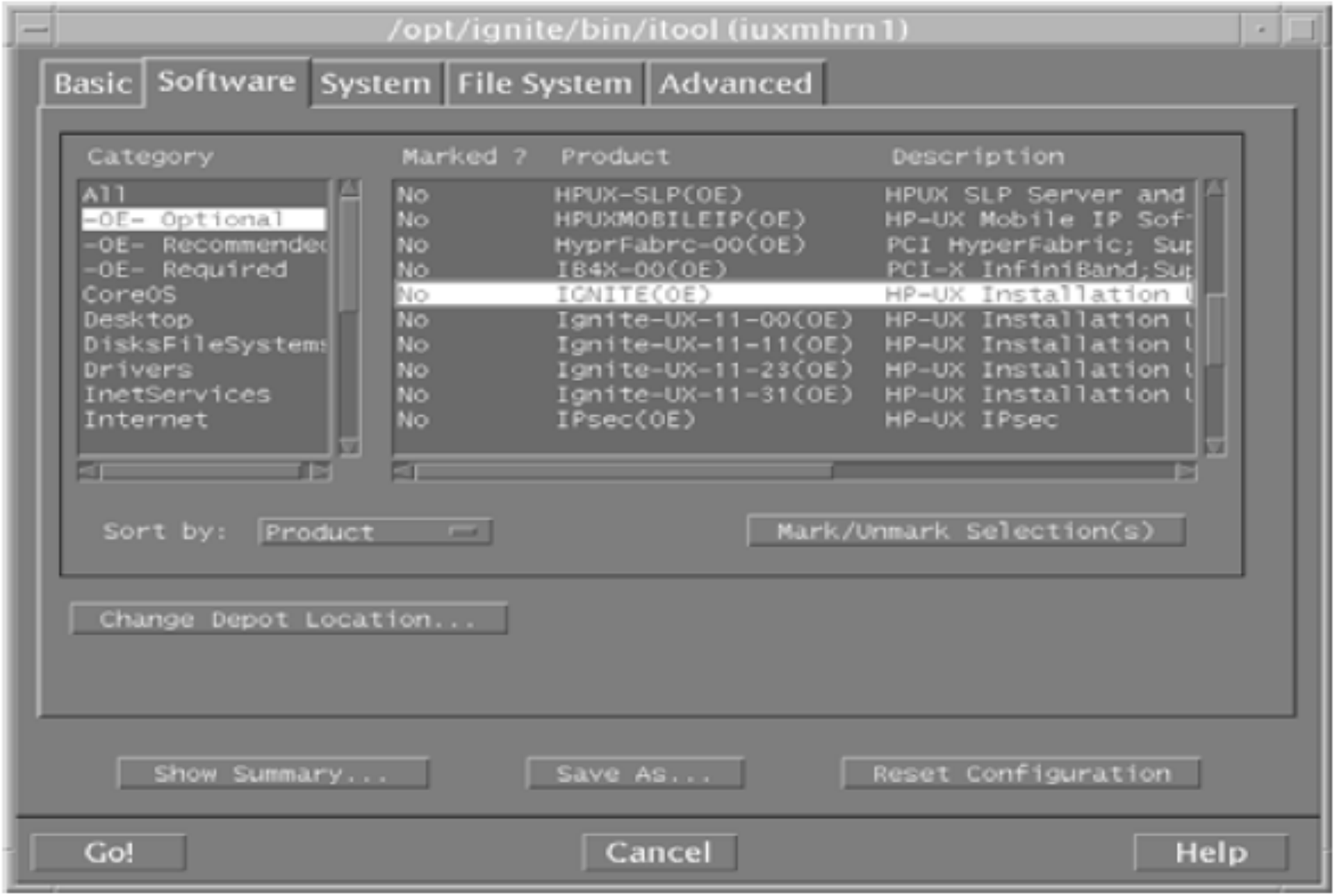
- If you require it, you must explicitly select the CDE bundle (CDE-XXX)
  - This applies if you need dtterm, which is located in CDE
    - For some localization situations, dtterm is required

Differences in the Cold-Install to HP-UX 11i v3, 3 of 3

Select and deselect software bundles on the **Additional Software** screen

- HP-UX 11i v3 offers several product categories
  - Each product category contains software components that are marked as *required*, *recommended*, or *optional*
    - HP recommends **NOT** deselecting recommended bundles or removing them from your system unless you know for certain that the software contained in these bundles are not required for your operating environment

Selecting and Deselecting Software Bundles



Updating to HP-UX 11i v3

Process is similar to HP-UX 11i v2

- Install the latest update-ux(1M) program
- Run update-ux

Supports the HP-UX 11i v3 update paths

- From HP-UX 11i v2 on both PA and Itanium-based systems
- Checks made for supported hardware

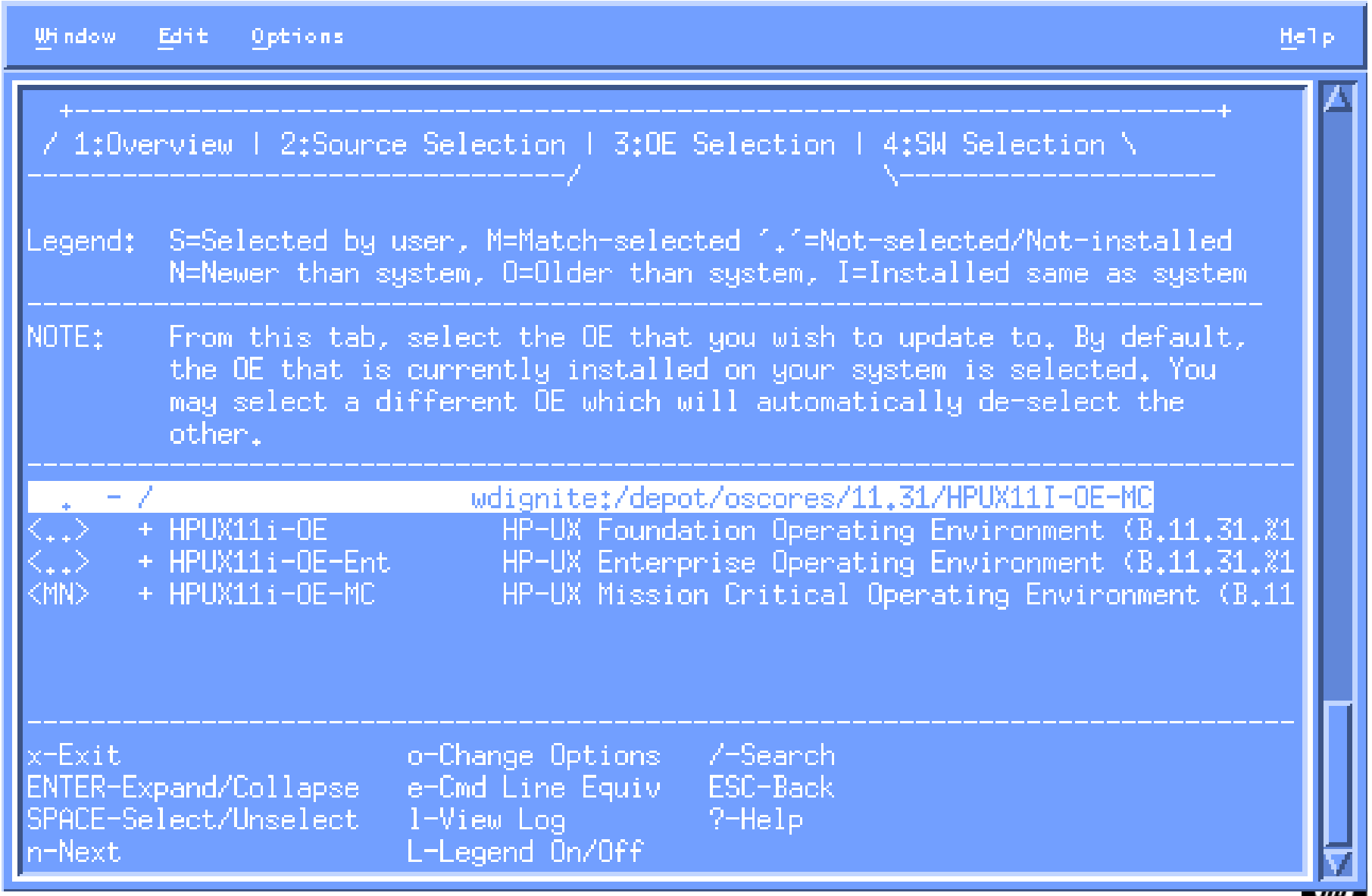
update-ux is similar to previous versions

- New –i option invokes swm TUI
- New –p option runs analysis only

Bundles for selected OE will be automatically selected if you specify an OE at invocation

- Choose other packages/bundles as desired

Update-ux – New TUI


Window Edit Options Help
1:Overview | 2:Source Selection | 3:OE Selection | 4:SW Selection
Legend: S=Selected by user, M=Match-selected '.'=Not-selected/Not-installed
N=Newer than system, O=Older than system, I=Installed same as system
NOTE: From this tab, select the OE that you wish to update to. By default,
the OE that is currently installed on your system is selected. You
may select a different OE which will automatically de-select the
other.
. - / wdignite:/depot/oscores/11.31/HPUX11I-OE-MC
<.> + HPUX11i-OE HP-UX Foundation Operating Environment (B.11.31.%1
<.> + HPUX11i-OE-Ent HP-UX Enterprise Operating Environment (B.11.31.%1
<MN> + HPUX11i-OE-MC HP-UX Mission Critical Operating Environment (B.11
x-Exit o-Change Options /-Search
ENTER-Expand/Collapse e-Cmd Line Equiv ESC-Back
SPACE-Select/Unselect l-View Log ?-Help
n-Next L-Legend On/Off

Verifying the Install/Update Using Logs

Changed log file on HP-UX 11i v3

- HP-UX 11i v2 log file is /var/adm/sw/swagent.log
- HP-UX 11i v3 log file is /var/opt/swm/swm.log

Carefully review contents of /var/opt/swm/swm.log

- Pay particular attention to ERROR and WARNING messages
- You'll get LOTS of NOTE messages on Update
- Not everything will appear in the log
  - Bastille bundle selection, for example

Verifying the HP-UX 11i v3 Cold Install or Update Using SW Tools

List all software installed on the system

- Check that all bundles/products/filesets are installed

```
/usr/sbin/swlist –l [bundle | product | fileset]
swlist –l bundle –l product > /tmp/software_list
```

- Check the list for products and bundles you desire
- For cold install, compare to OE and App DVDs

swlist –l bundle –l product –s /dvdrom > /tmp/dvdcontent

Verify that packages are intact

```
/usr/sbin/swverify \*
```

- Check /var/adm/sw/swverify.log and /var/adm/sw/swagent.log

Post-Install Tasks, 1 of 3

Configure OE applications

- Check log file for messages regarding required changes

Migrate to Agile Mass Storage Stack, if desired

- Installing causes both legacy and persistent DSFs to be created
- Installing configures system devices to use persistent DSFs
  - Boot, root, swap, and dump devices
- Configuration files use persistent DSFs
  - /etc/fstab, /etc/lvmtab

Post-Install Tasks, 2 of 3

Retrieve information after cold installing

- Create a new root home directory, e.g. /homeroot
  - Modify /etc/password
  - Move root's dot files to /homeroot
- Recover files
  - Logout and log back in as root
  - Manually merge your previously saved files
- Restore your local home directory, e.g. /home
  - Copy it back from another directory or tape where you stored it
- Restore other files

Post-Install Tasks, 3 of 3

Install other OE applications

New versions of configuration files/scripts are loaded

- If any of these were modified, modifications will have to be reapplied

New Software Deployment Tool – Software Manager (swm)

Provides a CLI and TUI to manage software, including bundles, products, sub-products and filesets

- Similar to SD commands except swm is a single command with major modes

Extends functionality provided by SD

- And has the ability to update from one operating environment to another

Has four major modes of operation

- ‘swm install’ installs software
- ‘swm list’ lists software
- ‘swm job’ provides job control interface to existing jobs
- ‘swm oeupdate’ updates an operating environment

Ignite-UX v C.7.0 on HP-UX 11i v3

Multipath-Aware Ignite

- Is aware of all hardware paths leading to a device

Operating Environments restructuring affects Ignite-UX

- Software products grouped as “Required,” “Recommended,” and “Optional”

Integrates with SWM rather than SD for software installation tasks

User selectable archive format for recovery archives and golden archives

Ignite-UX checks minimum memory requirements

- Will not permit installation or recovery to proceed if the system is below the memory limit

Ignite-UX bundle structure has been changed

Dynamic Root Disk (DRD) on HP-UX 11i v3

DRD Software deployment tool improves the OE update experience

DRD safe software packaging

- Enable HP-UX software to be patched and updated while the system is doing productive work during normal business hours

Software deployment tools enhanced

- Support improvements to the HP-UX Operating Environments

Provides the ability to create and manipulate an inactive system image

- Inactive system environment is a bootable system environment that is not currently in use by the running system

Software packaging changes made to support DRD

- Generate backward compatible packages that work with or without DRD

New software packaging attributes and environment variables are added for DRD safe packaging

Dynamic Root Disk (DRD) on HP-UX 11i v3

Provides the ability to create and manipulate an inactive system image

- Inactive system environment is a bootable system environment that is not currently in use by the running system
  - Used for a variety of purposes
    - Recovering system in event of failure
    - Preparing new system environment while preserving existing system environment

Software packaging changes made to support DRD

- Generate backward compatible packages that work with and without DRD

New software packaging attributes and environment variables are added for DRD safe packaging

- An attribute to indicate that software package is safe for install to an inactive DRD environment
- An environment variable to indicate that the package is being installed or managed in a DRD modification environment

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PCI Card On-line Deletion on HP-UX 11i v3

PCI card OLD allows deleting PCI cards and associated drivers without requiring a system reboot

- PCI OLAR on HP-UX 11i v2 enhanced to include deletion
- Now, full PCI OL*

HP-UX 11iv3

Flexible Capacity Features

Performance and Scalability on HP-UX 11i v3

Support Montecito processor features on Integrity systems

- Allow 256 hardware threads

Larger memory configuration

- Up to 2TB and pre-enabled up to 4TB

Increased file system and file sizes

- File system sizes up to 32 TB and file sizes up to 16 TB

Performance monitoring system tools and interfaces

- Processor performance monitoring tool, perfmon
- Mercury library, libhg*, enables user programs to measure performance
- sar and pstat reporting enhancements
- Kernel instrumentation enhancements
  - Used by OpenView GlancePlus, OpenView Performance Agent, Prospect, and sar(1M) command

HT and LCPU Enablement Summary

HT can only be enabled and disabled in firmware at system boot

- Firmware setting used to turn on/off hyper-threading for the entire machine statically at boot

LCPUs can be enabled and disabled dynamically at the granularity of a processor set (pset)

- Provides a “safe-haven” for applications that prefer single-threaded hardware
  - Real-time, high performance technical apps, etc.
- Disabled LCPUs are parked in firmware in a power saving mode

For a customer to use HT

- HT must be enabled at boot in firmware
- AND
- LCPUs must be enabled dynamically in HP-UX

State of HT and LCPU enablement persists across reboots

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Virtualization Technology

A set of hardware enhancements to Intel platforms

- VT-i refers to the Intel Itanium architecture and processor virtualization enhancements

Designed to simplify virtualization software

- HP Integrity VM is HP's software virtualization machine

Virtualization brings new end user value and new differentiation opportunities

- Sufficient isolation between different virtual machines
- Uncompromised performance of each virtual machine
- Availability, reliability, and security of the entire platform

PCI On Line Deletion (PCI OLD)

PCI OL* is an HA feature for interface cards

- Is core HP-UX functionality
- Minimizes customer risk and downtime
- Allows “hot-plugging” of I/O cards
  - Eliminates the need to reboot
- On Line Deletion is new on HP-UX 11i v3

Benefits of the new PCI OLD feature

- Remove bad cards
- Move card resources from one Peripheral Device to another
- Move card resources from one vPar to another
- Remove card and replace with a different card
- Perform Cell OL*
  - Coming in an HP-UX 11i v3 update

HP-UX 11i v3 Dynamic Resource Reconfiguration Features

Memory migration between Integrity VM guests

Dynamic memory migration between vPars guests

Cell OLA to nPars

Cell OLA to Integrity VM host

Cell migration between nPars

Cell migration between Integrity VM hosts

Cell OLD with physical removal from nPar

Cell OLD with physical removal from Integrity VM host

Cell OL* delivered post-LR in later HP-UX 11i v3 update

Integrity VM has a separate release schedule

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Dynamic Resource Reconfiguration & Cell OL

Dynamic Resource Reconfiguration

- Ability to change hardware resources used by OS instances
  - Improves resource utilization
  - Satisfies application service level agreements

Cell OL A/D

- Coming with HP-UX 11i v3 Sep 2007 update release
- Dynamically add/delete cell board to/from running OS instance
  - Cell board includes CPUs, memory, and (optionally) I/O
  - Includes when cell is physically inserted/removed and when cell is logically reassigned
    - Cell iCAP and Cell migration

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Cell On Line Deletion, 1 of 2

Coming on HP-UX 11i v3

- A cell can be deleted from an nPar while the OS runs
  - Earlier releases require a reboot for the deletion to take effect
- Deleted cell must be a floating cell
- If cell is attached to I/O expander, all PCI cards must have been deleted using PCI OLD commands

Applies only to a cellular complex

- rp7420, rp7440, rp8420, rp8440, rx7620, rx7640, rx8620, rx8640
- HP 9000 Superdome servers
  - Includes SD16A, SD32A, and SD64A models
  - Does not include SD16000, SD32000, and SD64000 models
- HP Integrity Superdome
  - SD16A, SD32A, and SD64A, SD16B, SD32B, and SD64B

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Cell On Line Deletion, 1 of 2

Cell OLD and tunables

- Memory based tunables adjusted as part of OLD operation

Cell OLD reduces resources in an nPar

- Performance capacity diminished proportionately

New command performs cell OL* operations

- parolrad(1M)

Documentation

- Man pages for parcreate (1M), parmodify (1M), parstatus (1M), parolrad (1M)
- HP System Partitions Guide Administration for nPartitions

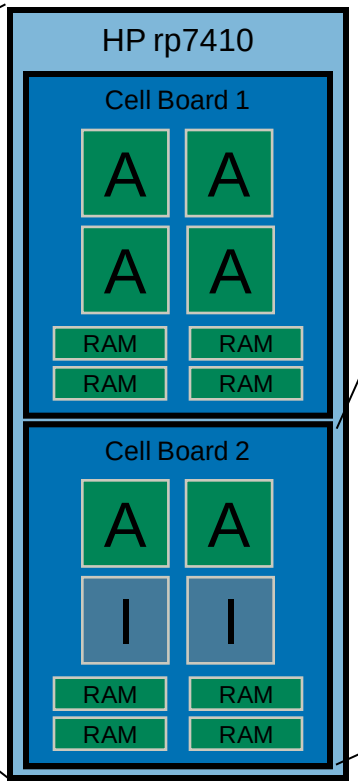
HP-UX Instant Capacity (iCAP)

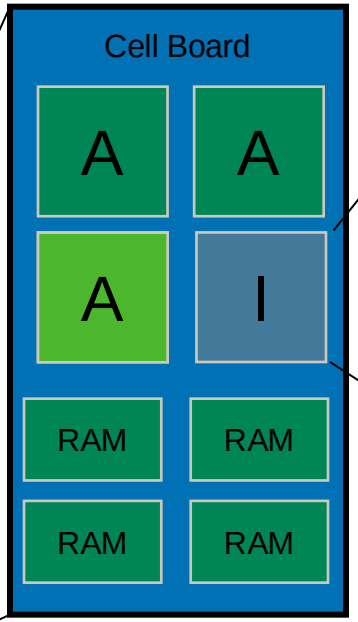
Single Physical Node
e.g. single 8-core HP Integrity rx7620

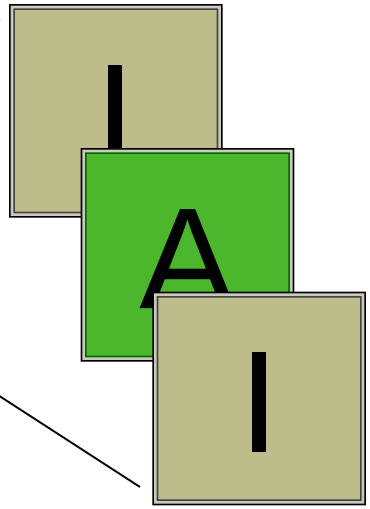
Cell Board instant Capacity
Inactive cell board containing four dormant CPUs

CPU instant Capacity
One or more inactive CPUs per cell board

Temporary instant Capacity
Temporary use (30 days/ 720 hours) of CPU time







A = Active
I = Inactive

Granularity / Flexibility

Understanding WBEM and EVM

WBEM is HP's strategic management infrastructure

- Is industry standard
- Ties together multiple HP-UX, Linux, & Windows systems
- Provides secure distributed management
- Includes object instances, methods, and indications (events)

EVM is HP-UX's lightweight event handling system

- Provides HP-UX-specific event subscription and notification interfaces and an event delivery mechanism
- Unifies HP-UX low-level kernel and user space events
- Is usable within the kernel and in single user mode
- Is optimized for events
  - Does not support instances or methods
- Has interfaces that are callable from C and shell scripts
  - Interfaces are non-standard
- Events are available as WBEM indications via the EVM CIM provider

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HP-UX 11i v3 Mass Storage Stack

Re-architected Mass storage stack

Key Features

- Native multi-pathing built-in
- Agile device files based on LUN WWID addressing
- Device files and dev_t and path/location independent
  - dev_t fully opaque
    - No longer encodes path (cXtYdZ) or device specific options in minor number
- New features for management and trouble-shooting

HP-UX 11i v3 to 11i v2 I/O Stack Comparison

Product/Functionality	HP-UX 11iv3	HP-UX 11i v2
Max LUNs per system – Architectural	**16M**	32K
Max LUNs per system – tested	**16K**	8K
Max paths per LUN - tested	**32**	8
Max LUN paths per system - tested	**64K**	16K
Max storage controllers (bus instance limits)	**16M**	256
Native Multi-Pathing & Load Balancing	**Yes**	No
Dynamic LUN size expansion	**Yes**	No
Automatic Device Discovery	**Yes**	No
Agile Addressing	**Yes**	No

Agile Addressing and Multi-pathing Overview

Agile Addressing

- Also known as Persistent LUN Binding
- Persistent Device Special Files
- New naming convention for mass storage devices
- Virtualized hardware path for multi-pathing

Multi-pathing

- Built-in multi-pathing
- Transparent load balancing
  - Choice of load balancing algorithms
- Automatic handling of path and device changes
- Integration with management software
- Health tracking of mass storage devices

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Table of Persistent and Legacy DSF Names

Persistent DSF Name	Legacy DSF Name	Description
/dev/disk/disk#	/dev/dsk/c#t#d#	The entire disk (block access)
/dev/rdisk/disk#	/dev/rdsk/c#t#d#	The entire disk (raw access)
/dev/disk/disk#_p#	/dev/dsk/c#t#d#s#	Partition on the disk (block access)
/dev/rdisk/disk#_p#	/dev/rdsk/c#t#d#s#	Partition on the disk (raw access)
/dev/rtape/tape#options	/dev/rmt/c#t#d#options	Tape device (raw access)
/dev/rchgr/autoch#	/dev/rac/c#t#d#_options	Autochanger device (raw access)

Hardware Pathing on HP-UX 11i v3, 1 of 3

Three different types of paths to a device

- Legacy hardware path
- Lunpath hardware path
- LUN hardware path

Paths are numeric strings of hardware components

- Each number represents location of a component on the path to the device

Legacy hardware path

- Series of bus-nexus addresses separated by /’s leading to a host bus adapter (HBA)
- Components below HBA are separated by .’s
- 0/0/2/0.1.7.0

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Hardware Pathing on HP-UX 11i v3, 2 of 3

Lunpath hardware path

- Used for mass storage devices, or LUNs
- Format printed by agile view
- Series of bus-nexus addresses separated by /'s leading to a host bus adapter (HBA)
- Components below HBA are in hex
  - Leading element(s) represent transport-dependent target address
  - Final element is a LUN address
    - 64-bit representation of LUN id reported by target
- Examples
  - Fibre Channel (FC)
    - 0/2/1/0.0x50001fe1500170ac.0x4017000000000000
  - SCSI
    - 0/1/1/0.0xd.0x0
    - Looks like legacy, except that the last two numbers are in hex

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Hardware Pathing on HP-UX 11i v3, 3 of 3

LUN hardware path

- Virtualized path representing all lunpaths to a single LUN
- Printed in agile view
- Virtual bus-nexus with an address of 64000
- Addressing below the virtual root node
  - Virtual bus address / Virtual LUN identifier
- Example
  - 64000/0xfa00/0x22

Virtualized path implications and benefits

- LUN hardware path is handle to LUN
  - Does not represent the LUN's physical location
- Linked to the LUN's World Wide Identifer (WWID)
- LUN binding is persistent
  - Across physical path changes and across reboots

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Changes to I/O Commands

ioscan – Displays views of I/O hardware & devices

insf – Creates device files for adapters & devices

mksf – Creates device file for specific device

lssf – Displays device & dsf information

rmsf – Deletes the DSF, or I/O nodes

ioinit – Allows modification of ioconfig file

- Allows online reassignment of instances if driver supports it via -f option
  - User specifies file containing information on list of instances to be reassigned
  - Limitation that number of entries in file cannot exceed 14 at a time
    - Call ioinit several times to reassign more than 14 instances online

iofind – Migrates old DSFs to new style persistent DSFs

iobind – Changes driver binding

io_redirect_dsf – Allows transparent device replacement

Display legacy hw path, lunpath hw path, and LUN hw path Mappings

Window Edit Options Help

```
# ioscan -m hwpath | head -19
Lun H/W Path      Lunpath H/W Path                    Legacy H/W Path
=================================================================
64000/0xfa00/0x0
                  0/0/2/0.0.0x0.0x0                   0/0/2/0.0.0.0
64000/0xfa00/0x1
                  0/1/1/0.0x1.0x0                     0/1/1/0.1.0
64000/0xfa00/0x2
                  0/1/1/0.0x0.0x0                     0/1/1/0.0.0
64000/0xfa00/0x3
                  0/1/1/1.0x2.0x0                     0/1/1/1.2.0
64000/0xfa00/0x4
                  0/4/1/0.0x50001fe15006bbad.0x0      0/4/1/0.109.14.255.0.0.0
                  0/4/1/0.0x50001fe15006bbac.0x0      0/4/1/0.102.13.255.0.0.0
                  0/4/1/0.0x50001fe15006bba9.0x0      0/4/1/0.102.14.255.0.0.0
                  0/4/1/0.0x50001fe15006bba8.0x0      0/4/1/0.109.13.255.0.0.0
                  0/4/1/1.0x50001fe15006bbad.0x0      0/4/1/1.109.14.255.0.0.0
                  0/4/1/1.0x50001fe15006bbac.0x0      0/4/1/1.102.13.255.0.0.0
                  0/4/1/1.0x50001fe15006bba9.0x0      0/4/1/1.102.14.255.0.0.0
                  0/4/1/1.0x50001fe15006bba8.0x0      0/4/1/1.109.13.255.0.0.0
# 
```

New scsimgr Command

Window Edit Options Help

```
# ioscan -N -C lunpath
H/W Path  Class                                 Description
=============================================
0/0/2/0.0.0x0.0x0                                  lunpath LUN path for disk4
0/1/1/0.0x0.0x0                                 lunpath    LUN path for disk6
0/1/1/0.0x1.0x0                                 lunpath    LUN path for disk5
0/1/1/1.0x2.0x0                                 lunpath    LUN path for disk7
0/4/1/0.0x50001fe15006bba8.0x0                  lunpath    LUN path for ctl16
0/4/1/0.0x50001fe15006bba9.0x0                  lunpath    LUN path for ctl16
0/4/1/0.0x50001fe15006bbac.0x0                  lunpath    LUN path for ctl16
0/4/1/0.0x50001fe15006bbad.0x0                  lunpath    LUN path for ctl16
0/4/1/1.0x50001fe15006bba8.0x0                  lunpath    LUN path for ctl16
0/4/1/1.0x50001fe15006bba9.0x0                  lunpath    LUN path for ctl16
0/4/1/1.0x50001fe15006bbac.0x0                  lunpath    LUN path for ctl16
0/4/1/1.0x50001fe15006bbad.0x0                  lunpath    LUN path for ctl16
[rx26-183]/
# scsimgr get_info -C lunpath -I 1

        STATUS INFORMATION FOR LUN PATH : lunpath1

Generic Status Information

SCSI services internal state                    = UNOPEN
Open close state                                = ACTIVE
Protocol                                        = parallel_scsi
EVPD page 0x83 description code                 = 1
EVPD page 0x83 description association          = 0
EVPD page 0x83 description type                 = 3
World Wide Identifier (WWID)                    = 0x50014c3003545a4c
Total number of Outstanding I/Os                = 0
Maximum I/O timeout in seconds                  = 30
Maximum I/O size allowed                        = 1380352
Maximum number of active I/Os allowed           = 8
Maximum queue depth                             = 8
Queue full delay count                          = 0
[rx26-183]/
#
```

scsimgr get_attr –D <disk DSF> settable

Window Edit Options Help

```
# scsimgr get_attr -D /dev/rdisk/disk3_p2 settable

          SCSI ATTRIBUTES FOR LUN : /dev/rdisk/disk3_p2

Generic Attributes :

name = alias
current =
default =
saved =

name = transient_secs
current = 60
default = 60
saved =

name = leg_mpath_enable
current = true
default = true
saved =

name = max_q_depth
current = 8
default = 8
saved =

Driver esdisk  Attributes :

name = path_fail_secs
current = 30
default = 30
saved =

name = load_bal_policy
current = round_robin
default = round_robin
saved =

name = infinite_retries_enable
current = false
default = false
saved =

name = preferred_path
current =
default =
saved =

#
```

scsimgr get_attr –H <hardware path>

Window Edit Options Help

```
# scsimgr get_attr -H 0/1/1/0/1/1.0x6.0x0

        SCSI ATTRIBUTES FOR LUN PATH : 0/1/1/0/1/1.0x6.0x0

Generic Attributes :

name = state
current = ACTIVE
default =
saved =

name = protocol
current = parallel_scsi
default =
saved =

name = lunid
current = 0
default =
saved =

name = class
current = lunpath
default =
saved =

name = instance
current = 5
default =
saved =

name = hw_path
current = 0/1/1/0/1/1.0x6.0x0
default =
saved =

#
```

USB-00 Subsystem and Device Drivers

Dynamically managed device file system

- Dynamic device special file creation and removal

Additional USB features

- Plug-and-play of USB devices
- Support for mass storage drivers
  - USB CD-ROM/RW
  - DVD-ROM/+RW
- Boot/install from HP USB DVD devices

Supports mass storage encryption

Dynamically extensible

- Allows for fast development of new USB device drivers
- Object-oriented run-time infrastructure

Replaces legacy USB stack previously in various drivers

- HCD, HUB, HID, USBD legacy drivers removed

File System Tunables Changes on HP-UX 11i v3

More tunables converted to dynamic

- No need to reboot improves availability

Several tunables made automatic

- Memory changes cause tunable change

Usability issues addressed

- Unit tunables: percent(%), suffixes (K/KB/M/MB/GB)

Number of tunables reduced by more than ten

- Made private, deprecated, obsoleted, or removed

Capacity Expansion

Value

HP-UX File / File System Sizes

	Architectural		Tested		Individual
	FS Size	File Size	FS Size	File Size	**FS limits**
11iV1	2TB	2TB	2TB	2TB	**% HFS –128GB; VxFS - 2TB;**
11iV2	8EB	2TB#	32TB	2TB	**% HFS – 128GB; VxFS3.5 – FS 32TB, F 2TB;**
11iV3	8EB	8EB	**VxFS - 32TB***	**VxFS - 16TB***	**% HFS – 128GB; VxFS4.1 – 8EB;**
11.XX	8EB	8EB	**Customer driven**	**Customer driven**	**VxFS4.1 – 8EB;**

* Qual targets # OS – 8EB % HFS deprecated

Unified File Cache (UFC) Overview

Integrates page cache and buffer cache

Provides coherency when accessing a file using both read(2)/write(2) and mmap(2) system calls simultaneously

- The read/write file system calls used the buffer cache to cache file data prior to HP-UX 11i v3
- The mmap system call used the page cache before HP-UX 11i v3

Enables ports of NFS ONC 2.3 and VxFS 4.1

Improves compatibility with other Unix-based OSs

Potential performance improvements

LVM on HP-UX 11i v3

LVM has key improvements for HP-UX 11iv3

- Full support of the new re-architected mass storage stack
- New Features
- Improved scalability
- Increased performance
- Improved System Management
- Improved High Availability features

Providing key features and functionality in the following areas

New Features

- RAID (0 + 1)
- RAID (1 + 0)
- Dynamic LUN Expansion Support
- VG Modify

Scalability

- Increased Logical Volume Size
- Increased default VG Values

Performance

- Large I/O support
- Performance Tuning
- Fine Grain Striping support

Manageability

- FSWEB integration
- Volume Group Suspend
- Improved CLI display commands
- Support for Legacy and new DSF's
- EMT Support

High Availability

- Disk OLR
- Improved Error detection
- Improved Mirror Recovery
- Online Cluster Reconfiguration

Process Management Interface Expansion

Range of PIDs increased from max of 30,000 to 1,073,741,823, which is 2^^30-1

Dynamic kernel tunable – nproc

- New maximum value stated to be 256,000

Limit on username and groupname lengths expanded

- Now 255 bytes, up from 8 bytes and 16 bytes

Longer node names supported

- New limit up to 255 bytes from previous 8 byte limit

Longer hostname supported

- New limit up to 255 bytes from previous 64 byte limit

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HP Virtual Partitions (vPars) A.05.01

New features in vPars in HP-UX 11i v3

- Dynamic, online memory migration
- Montecito hyperthreading support
- Mixing A.04.02 and A.05.01 virtual partitions in same vPars environment

Integrates with HP-UX dynamic solutions

- EVM, iCAP, PPU, PCI OL*, WLM, PRM
- Limited VSE manager (read configuration only)
- Future Fusion releases
  - VSE manager integration

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HP-UX 11iv3

Secured Availability Features

PCI Error Recovery – New on HP-UX 11i v3

Detect, isolate, and automatically recover from PCI error

- Avoids system crash

When error occurs on PCI bus with I/O card supporting PCI Error Recovery, automatic recovery steps are taken

- Isolate PCI bus from the rest of the system
- Attempt recovery from error
  - Keep bus and I/O card quiesced if a nested error occurs
- Re-initialize the bus

System Fault Manager (SFM)

Supported on all systems that support HP-UX 11i v3

Collection of tools used to monitor the health of HP servers

- Memory, CPU, power supplies, and cooling devices

Operates in the WBEM environment

- WBEM indications can be logged in syslog

Features include

- Event Manager
  - Common Information Model Provider (EVM-CIM)
- Error Management Technology (EMT)

Features not available on initial HP-UX 11i v3 release

- SFM Indication Provider
  - Use EVWeb Event Viewer to view equivalent indications
- EVWeb Log Viewer

HP threshold indications equivalent to indications generated by High Availability Monitors are now supported

- View HP threshold indications using the EVWEB Event Viewer

Accessing HP-UX Error Messages

HP-UX 11i v2

Accessing HP-UX error message information:

Go to HP ITRC website and search on error message

Examine each document returned

Search may return: HPUXERR01

This is the outdated HP-UX Error Message Catalog Manual that does not contain information on HP-UX Releases after January 1991

Document is limited in scope

HP-UX 11i v3

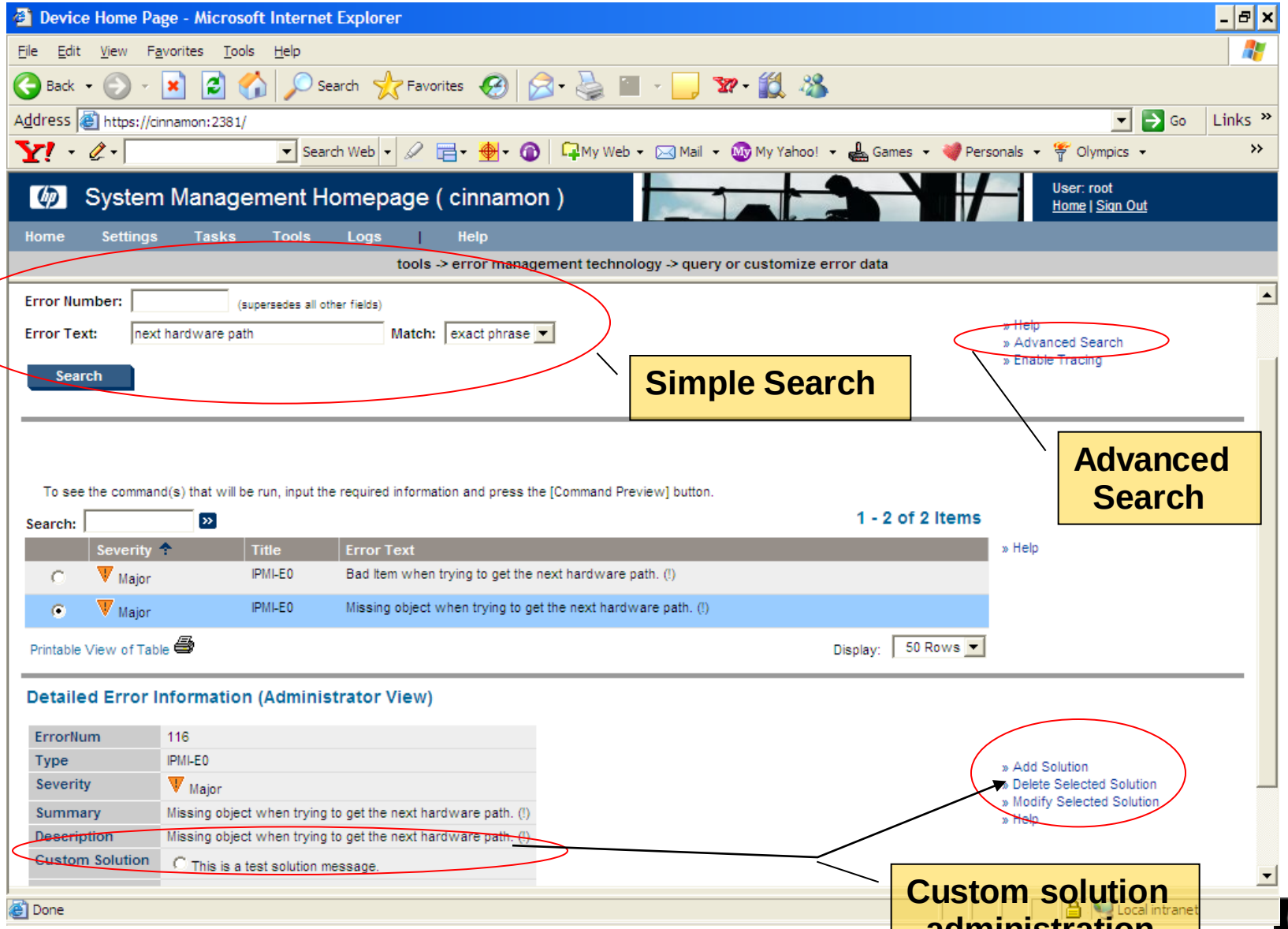
Accessing HP-UX error message information:

Online HP-UX error utility on each Customer system

Consolidated error information HP-UX 11i v3 release and onwards

Cause and action text provided for errors

EMT GUI integrated with SMH


Device Home Page - Microsoft Internet Explorer
System Management Homepage (cinnamon)
User: root
Home | Sign Out
Home Settings Tasks Tools Logs | Help
tools -> error management technology -> query or customize error data
Error Number:
(supersedes all other fields)
Error Text: next hardware path
Match: exact phrase
Search
» Help
» Advanced Search
» Enable Tracing
Simple Search
Advanced Search
To see the command(s) that will be run, input the required information and press the [Command Preview] button.
Search:
1 - 2 of 2 Items
Severity
Title
Error Text
Major IPMI-E0 Bad Item when trying to get the next hardware path. (!)
Major IPMI-E0 Missing object when trying to get the next hardware path. (!)
» Help
Printable View of Table
Display: 50 Rows
Detailed Error Information (Administrator View)
ErrorNum 116
Type IPMI-E0
Severity Major
Summary Missing object when trying to get the next hardware path. (!)
Description Missing object when trying to get the next hardware path. (!)
Custom Solution This is a test solution message.
» Add Solution
» Delete Selected Solution
» Modify Selected Solution
» Help
Custom solution administration
Done

Livedump on HP-UX 11i v3

Performs a crashdump on a live system **without** a forced shutdown or panic of that system

- Itanium-based platforms only

Use livedump to obtain a memory dump of the system

- System stays up and running, remaining stable
- Allows for subsequent offline analysis of system

Performance impact

- Saves the memory onto a file system
  - Causes extra system load during this save

Documentation

- livedump(1M) man page

Dump time reduction on HP-UX 11i Releases

In HP-UX 11i v1 and HP-UX 11i v2

- Two features to reduce system dump times
  - Selection
    - Reduces the size of the memory to be dumped
  - Compression
    - Reduces the size of the data that needs to be written to disk

In HP-UX 11iv3

- New third mechanism added
  - I/O parallelism
    - Increases the rate at which the data can be written to disk

Cache File System - CacheFS

CacheFS is a general purpose file system caching mechanism

- Improves NFS server performance and scalability by reducing server and network load

How does CacheFS work?

- Data is cached on local disk when it is read from an NFS mounted file system
- Subsequent read requests are satisfied from the local disk cache

How is performance improved?

- Local disk caching of remote NFS-served file systems reduces network traffic
- Reduced access requests to the server increases the server's performance and allows more clients to access the server

Performance improvements are dependent on the type of file system access

- Good for file systems where data is read more than once

CacheFS on HP-UX 11i v3 was ported from Solaris ONC+2.3 code

Identity Management on HP-UX

Data Repositories

- Red Hat Directory Server (LDAP Server)
- LDAP-UX Integration (LDAP Client)

Authentication Services

- HP-UX Identity Management Integration (HP IdMI)
- HP-UX Select Access for IdMI (HP SA-IdMI)

Authorization Services

- HP-UX Identity Management Integration (HP IdMI)
- HP-UX Select Access for IdMI (HP SA-IdMI)
- HP-UX Role Based Access Control (HP RBAC)

All are free on HP-UX

HP-UX 11iv3

Simplified Management Features

HP System Management Homepage (HP SMH) Overview

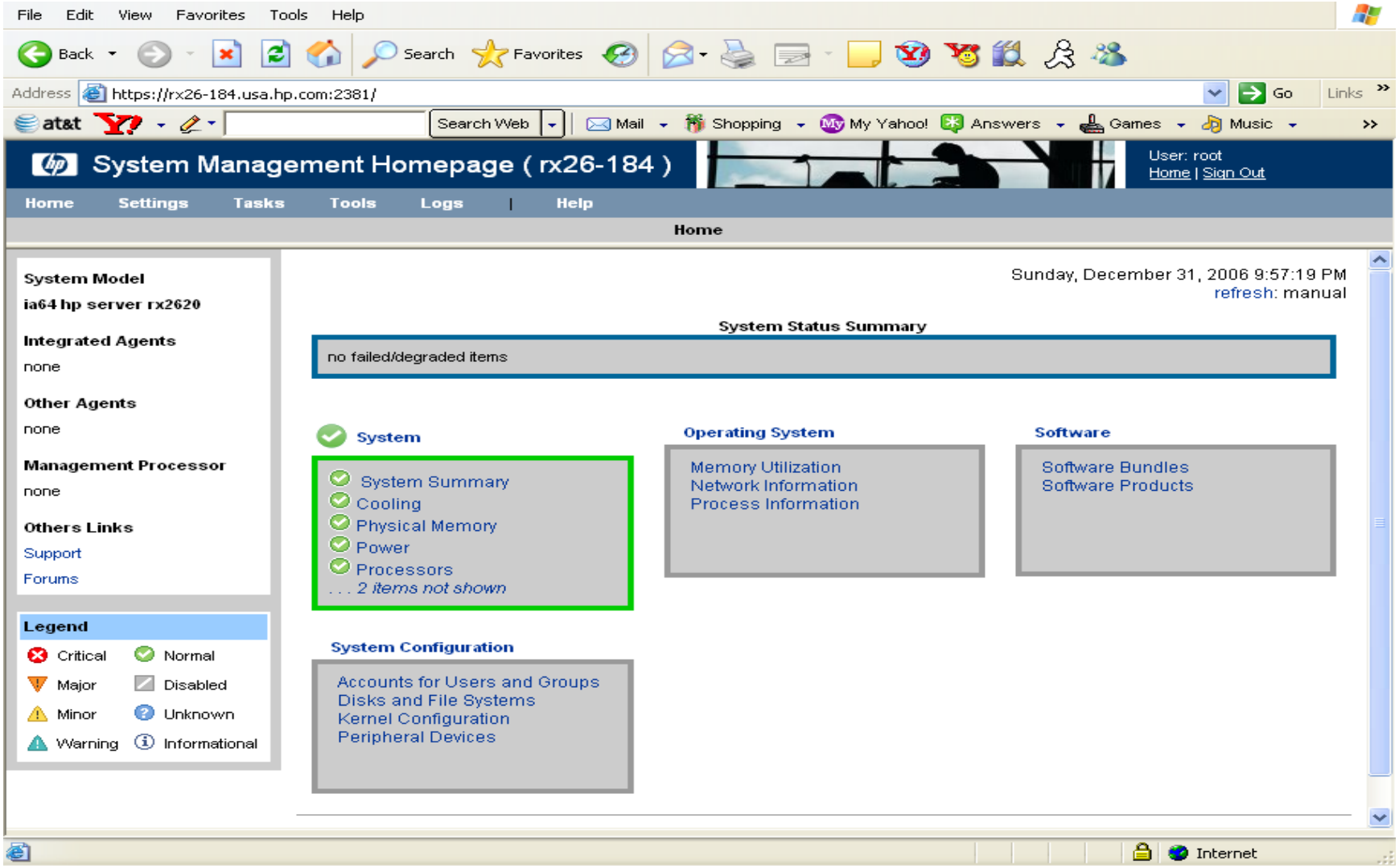
Web-based system administration tool for managing HP-UX 11i

- Provides Web-based systems management functionality
- At-a-glance monitoring of system component health
- Consolidated log viewing
- High performance UI that responds rapidly
- Provides Terminal User Interfaces

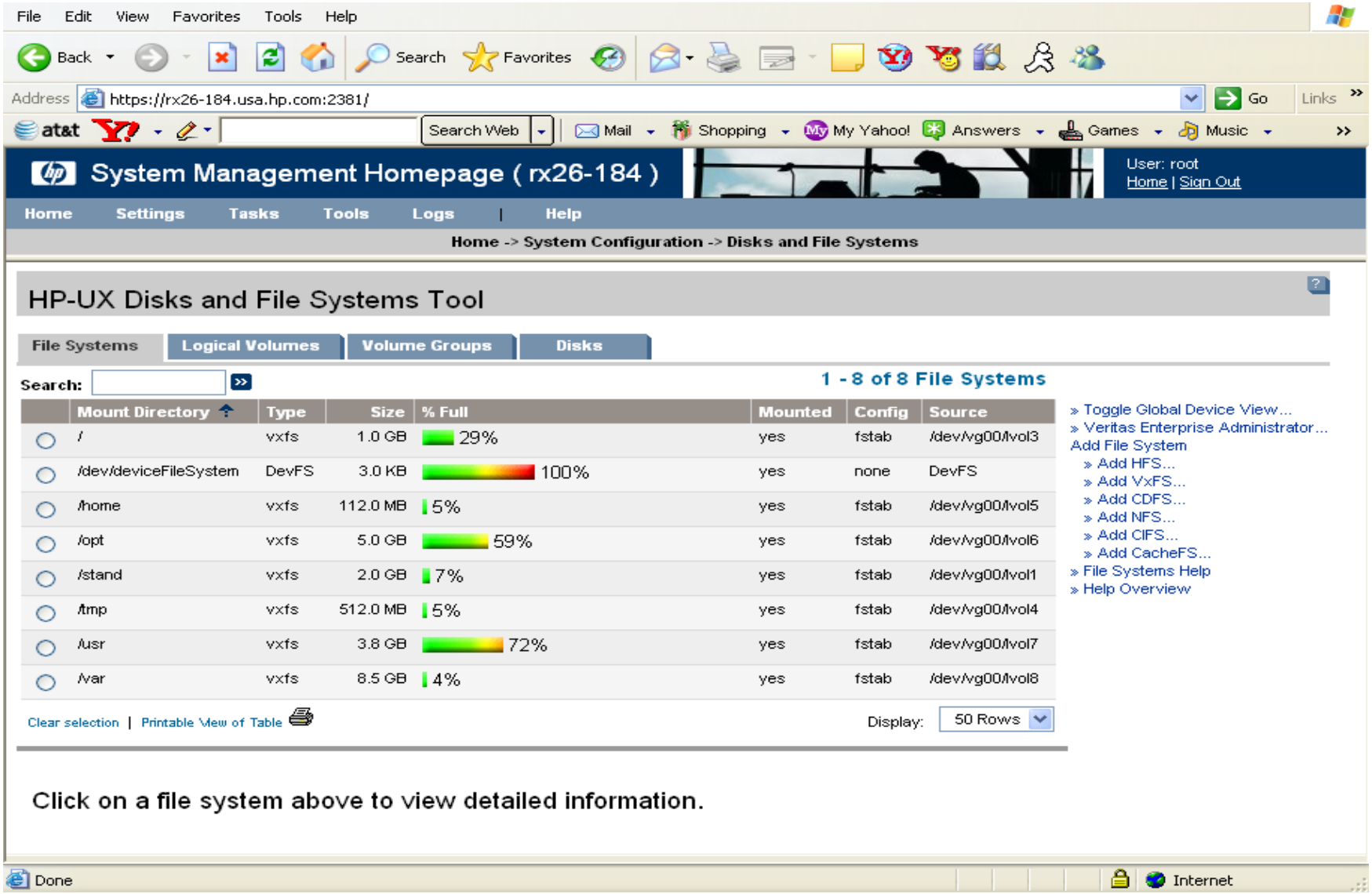
SMH for HP-UX provides many key customer benefits

- Host based authentication and tight integration with existing security infrastructure
- Management tools that consume minimal system resources
- Includes “start on demand” capabilities
- Highly responsive user interface supporting “access from anywhere” via a browser
- Usable “out of the box” (default installed) by root with no user configuration
- Seamless, secure integration with HP System Insight Manager (HP SIM)

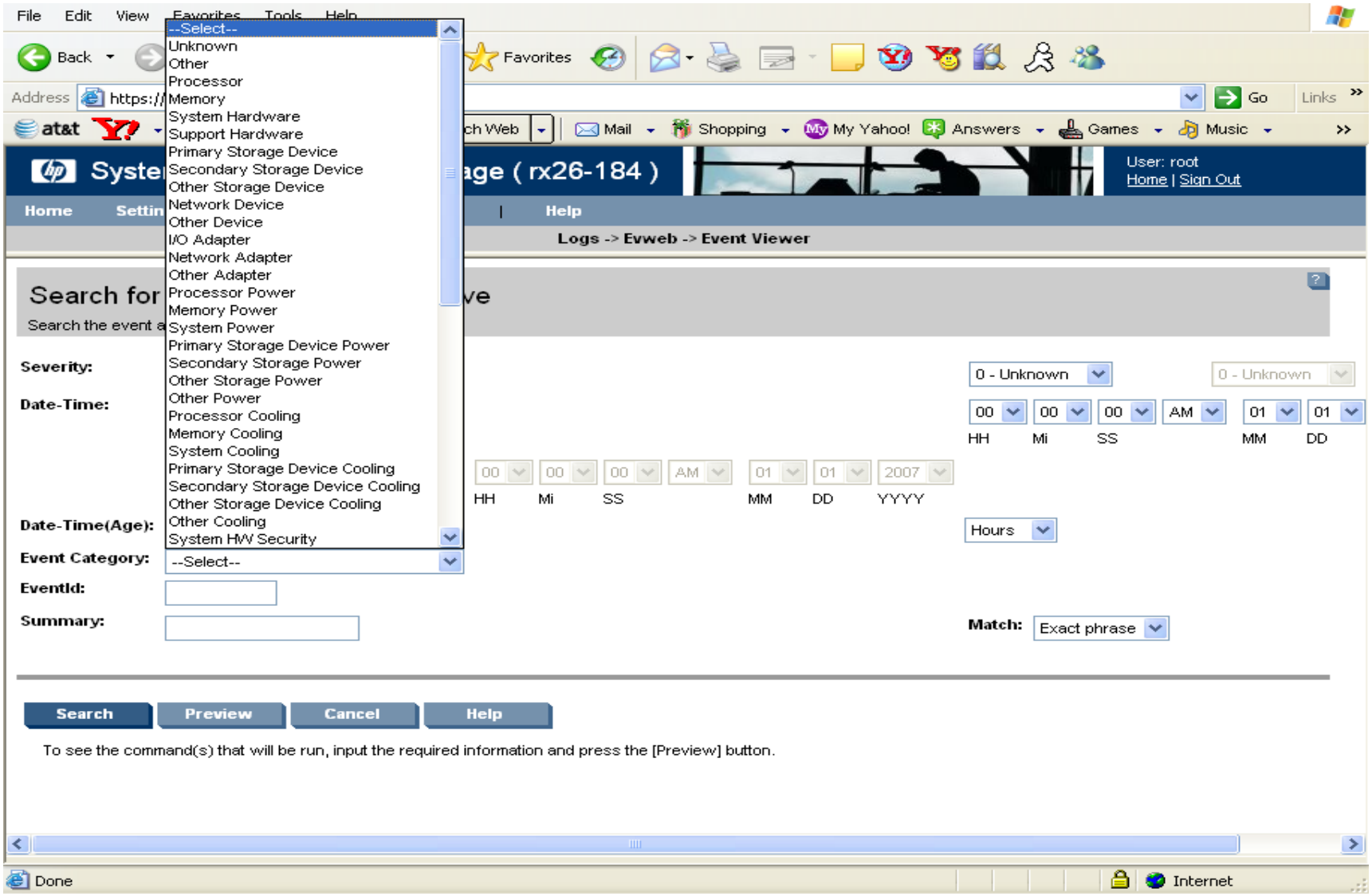
SMH GUI on HP-UX 11i v3



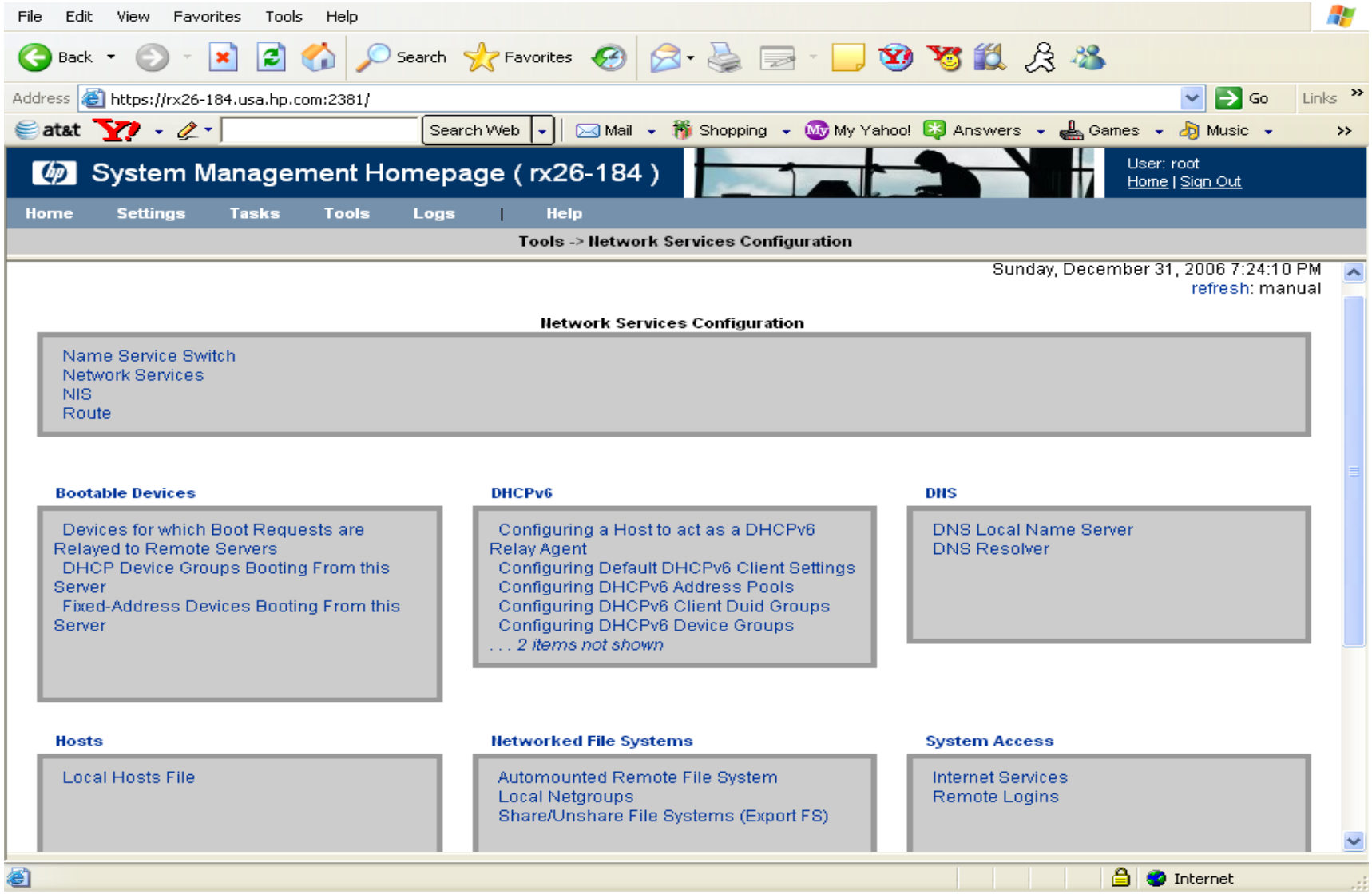
SMH GUI View of fsweb Area


File Edit View Favorites Tools Help
Back Search Favorites
Address https://rx26-184.usa.hp.com:2381/
Go Links
Search Web Mail Shopping My Yahoo! Answers Games Music
System Management Homepage (rx26-184)
User: root
Home | Sign Out
Home Settings Tasks Tools Logs | Help
Home -> System Configuration -> Disks and File Systems
HP-UX Disks and File Systems Tool
File Systems Logical Volumes Volume Groups Disks
Search:
1 - 8 of 8 File Systems
Mount Directory Type Size % Full Mounted Config Source
/ vxfs 1.0 GB 29% yes fstab /dev/vg00/lvol3
/dev/deviceFileSystem DevFS 3.0 KB 100% yes none DevFS
/home vxfs 112.0 MB 5% yes fstab /dev/vg00/lvol5
/opt vxfs 5.0 GB 59% yes fstab /dev/vg00/lvol6
/stand vxfs 2.0 GB 7% yes fstab /dev/vg00/lvol1
/tmp vxfs 512.0 MB 5% yes fstab /dev/vg00/lvol4
/usr vxfs 3.8 GB 72% yes fstab /dev/vg00/lvol7
/var vxfs 8.5 GB 4% yes fstab /dev/vg00/lvol8
» Toggle Global Device View...
» Veritas Enterprise Administrator...
Add File System
» Add HFS...
» Add VxFS...
» Add CDFS...
» Add NFS...
» Add CIFS...
» Add CacheFS...
» File Systems Help
» Help Overview
Clear selection | Printable View of Table
Display: 50 Rows
Click on a file system above to view detailed information.
Done
Internet

EVWeb Event Viewer Search by Event Category



Network Services Configuration - ncweb



Using nwmgr to get details on a LAN

Window Edit Options Help

```
[rx26-183]/
# nwmgr -v -c lan0
lan0:
   Interface State =UP
   MAC Address = 0x0017087C7B68
   Subsystem = iether
   Interface Type = 1000Base-T
   Hardware Path = 0/1/2/0
   NMID = 1
   Feature Capabilities = Physical Interface
                          IPV4 Recv CKO
                          IPV4 Send CKO
                          VLAN Tag Offload
                          64Bit MIB Support
                          IPV4 TCP Segmentation Offload
                          UDP Multifrag CKO
   Feature Settings = Physical Interface
                      VLAN Tag Offload
                      64Bit MIB Support
   MTU = 1500
   Speed = 100 Mbps Full Duplex (Autonegotiation : On)
[rx26-183]/
#
```

Event Manager (EVM) – New on HP-UX 11i v3

General mechanism for posting and distributing events from any part of the operating system to any interested party

Comprehensive event management system

- Works in cooperation with other event mechanisms
- Enables event information to be accessed in a uniform manner
- Enables posting, receiving, storing, retrieving and monitoring events

EVM event is the basis for all EVM operation

- Used to transport and store event information from many sources

Provides programming and user-level tools

- For creation, display and management of events

Event Monitoring Service (EMS)

Framework for monitoring system resources

- Configures, checks resource status, and sends notification when configured conditions are met
- Provides a common interface for monitor configuration and event notification

EMS monitors

- Provide help primarily with fault and resource management
- Are designed for use in high availability environments

invent